

WHAT IS CLAIMED IS:

1. A vehicular safety apparatus comprising:

determining means for determining a collision  
prediction level of a vehicle based on a relative  
5 position between the vehicle and an obstacle ahead of  
the vehicle;

storage means for storing an amount of brake  
operation by a driver at a point where the collision  
prediction level determined by the determining means  
10 exceeds a predetermined threshold, as a reference  
level; and

actuation control means for actuating the safety  
apparatus in accordance with an increase of the amount  
of brake operation of braking by the driver from the  
15 reference level stored in the storage means.

2. The vehicular safety apparatus according to  
Claim 1, further comprising prohibiting means for  
prohibiting the actuation control means from performing  
a control process if the determining means continuously  
20 determines the collision prediction level of not less  
than a predetermined level for a fixed period.

3. The vehicular safety apparatus according to  
Claim 1, further comprising prohibiting means for  
prohibiting the actuation control means from performing  
25 a control process in at least one of a case where a  
vehicular velocity is a predetermined low velocity

including a stop state and a case where a gearshift lever is placed in a non-forward position.

4. The vehicular safety apparatus according to Claim 1, wherein on the occasion of carrying out the control of the safety apparatus in accordance with the increase of the amount of brake operation from the reference level, the increase being supposed to be equal, the actuation control means carries out the control for greater increases in the higher collision prediction level than in the lower collision prediction level.

5. The vehicular safety apparatus according to Claim 1, wherein the actuation control means further comprises minimum control means for, when the increase of the amount of brake operation from the reference level is within a range of a predetermined small increase, carrying out the control of the safety apparatus in accordance with a predetermined increase over the range of the small increase.

6. The vehicular safety apparatus according to Claim 5, further comprising prohibiting means for prohibiting the minimum control means from performing the control if the increase of the amount of brake operation from the reference level is within the range of the predetermined small increase and if the reference level is within a predetermined slow braking

range.

5        7. The vehicular safety apparatus according to Claim 1, further comprising brake control means for generating a brake assist force to increase a braking force according to a braking operation,

wherein the actuation control means controls the brake control means to generate a greater brake assist force as the increase from the reference level becomes larger.

10       8. The vehicular safety apparatus according to Claim 7, wherein the amount of brake operation is a quantity indicating a force of driver's braking operation.

15       9. The vehicular safety apparatus according to Claim 8, wherein the force of driver's braking operation is a pressure of a brake master cylinder.

20       10. The vehicular safety apparatus according to Claim 1, wherein the determining means determines a larger collision prediction level with decrease in a value of a result of calculation of dividing a distance between the vehicle and the obstacle by a relative velocity of the obstacle to the vehicle.

25       11. The vehicular safety apparatus according to Claim 7, wherein the brake control means for generating the brake assist force is comprised of a pump motor for increasing a pressure of a wheel cylinder, and a

plurality of valves disposed on brake piping.

12. A vehicular safety apparatus comprising:

5 determining means for determining a collision prediction level of a vehicle on the basis of relative position and relative velocity between the vehicle and an obstacle ahead of the vehicle;

10 storage means for storing an amount of brake operation by a driver at a point where the collision prediction level of the vehicle determined by the determining means exceeds a predetermined threshold;

brake control means for generating a brake assist force; and

15 actuation control means for, while defining the amount of brake operation stored in the storage means as a reference level, determining the brake assist force to be generated by the brake control means based on an increase of the amount of brake operation from the reference level, and actuating the brake control means.

20 13. The vehicular safety apparatus according to Claim 12, wherein the amount of brake operation is a pressure of a brake master cylinder.

25 14. The vehicular safety apparatus according to Claim 13, wherein the determining means determines the collision prediction level based on a value of a result of calculation of dividing a distance between the

vehicle and the obstacle by a relative velocity of the obstacle to the vehicle.

5        15. The vehicular safety apparatus according to Claim 14, wherein the determining means determines a greater collision prediction level with decrease in the value of the result of the calculation.

10        16. The vehicular safety apparatus according to Claim 15, wherein on the occasion of determining the brake assist force according to an increase of the master cylinder pressure from the reference level, the actuation control means determines a greater brake assist force at the higher collision prediction level than at the lower collision prediction level.

15        17. The vehicular safety apparatus according to Claim 13, wherein on the occasion of determining the brake assist force according to an increase of the master cylinder pressure from the reference level, if the increase of the master cylinder pressure is less than a predetermined value, the actuation control means  
20        actuates the brake control means so as to generate a brake assist force corresponding to the predetermined value.